



Technology Careers: Exploring and Preparing for Opportunities

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Careers in the Technology Industry

- Technology careers exist in many areas, including **IT departments, technology equipment manufacturing, software and apps, technology service and repair, technology sales, educational training and support, and IT consulting.**
- IT department staff is responsible for **ensuring that all the computer operations, mobile devices, and networks run smoothly.** They also determine when and if the organization requires new hardware, systems, or software.

Careers in the Technology Industry

- Usually, these jobs are divided into the following areas:
 - ✓ Management
 - ✓ Research and development
 - ✓ Technical services
 - ✓ Operations
 - ✓ Training and support
 - ✓ Information security services
 - ✓ Marketing strategy

Careers in the Technology Industry

Technology Equipment Manufacturing

- The technology equipment field consists of manufacturers and distributors of computers, mobile devices, and other hardware, such as hard drives, monitors, printers, and communications and networking devices.
- Available careers in this field include positions with companies that design, manufacture, and produce computers and input, output, communications, mobile, and networking devices.



Careers in the Technology Industry

Software and Apps

- The software and apps field is comprised of companies that develop, manufacture and support a wide range of software and apps for computers, web, and mobile devices.

Technology Service and Repair

- The technology service and repair field provides preventive maintenance, component installation, and repair services to customers.

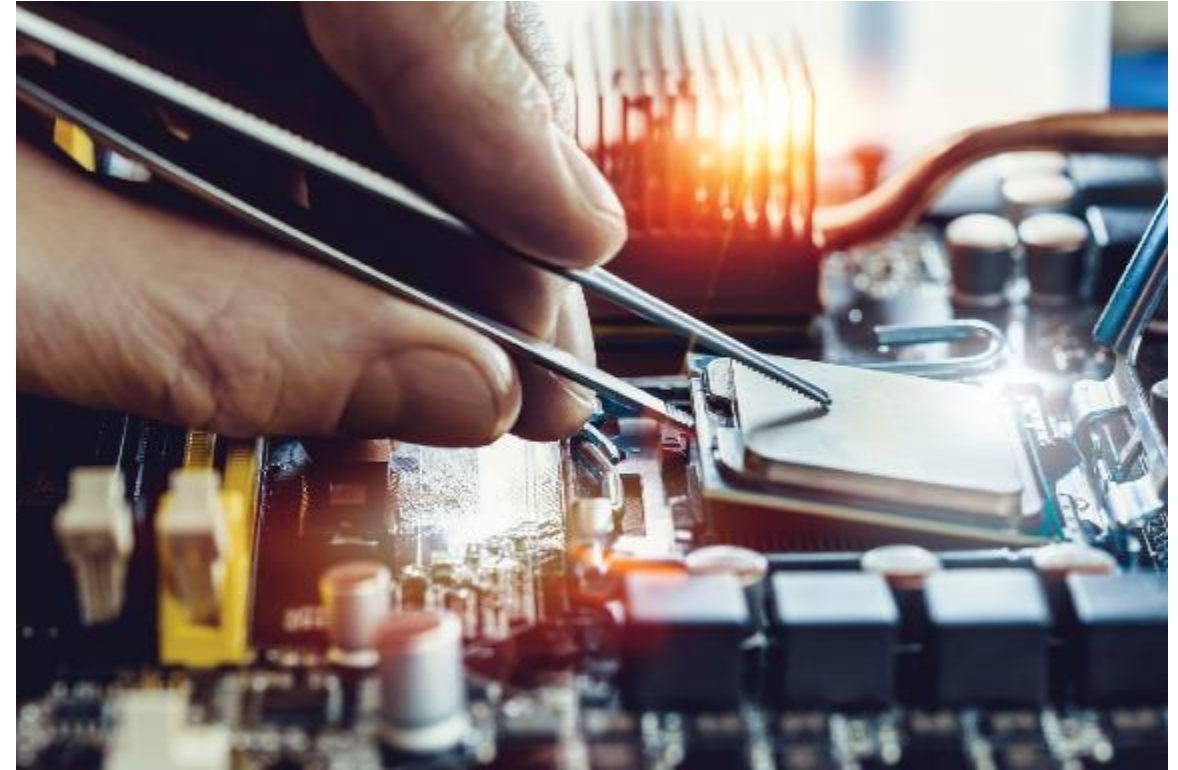


Figure 13-2: Technicians can install and fix internal components.

Careers in the Technology Industry

Technology Service and Repair

- Many technology equipment manufacturers include diagnostic software with their computers and devices that assists technicians in identifying problems.

Technology Sales

- Technology salespeople must possess a general understanding of technology and a specific knowledge of the product they are selling.

Technology Education, Training, and Support

- Schools, colleges, universities, and private companies all need qualified educators to **provide technology-related education and training**.
- The high demand in this field has led to a shortage of qualified instructors at the college level as instructors increasingly move to careers in private industry.

Careers in the Technology Industry

IT Consulting

- Technology professionals sometimes become IT consultants after gaining experience in one or more technology-related areas, such as software development, systems analysis, and design, network configuration, developing mobile devices, using social media, or web development.
- IT consultants, typically hired **based on expertise, provide technology services to clients**. Large enterprises often hire teams of consultants to offer advice about technology-related concerns.

Technology Job Titles and Descriptions

- Some of the more popular technology-related job titles for several categories of IT careers include system development; technology operations; web marketing and social media; data storage, retrieval, and analysis; and app development and mobile technologies.
- Careers in system development require you to analyze or create software, apps, databases, websites and web-based development platforms, and networks.

Technology Job Titles and Descriptions

Table 13-1: System Development Jobs.

Job title	Job description
Cloud Architect	Identifies business requirements, strategies, and solutions for cloud storage and services that meet a company's goals or needs
Cognitive Engineer	Develops artificial intelligence-based machines and programs based on data analysis to mimic human thought processes
Database Designer	Specifies the structure, interface, and requirements of a large-scale database; determines security and permissions for users
Program and App Developer	Specifies, designs, implements, tests, and documents programs and apps in a variety of fields, including robotics, operating systems, animation, and applications
Systems Analyst	Works closely with users to analyze their requirements, designs and develops new information systems, and incorporates new technologies

Technology Job Titles and Descriptions

Table 13-1: System development jobs (continued)

Job title	Job description
Systems Programmer	Installs and maintains operating system software and provides technical support to the programming staff
Web Designer	Designs the layout, navigation, and overall appearance of a website with a focus on user experience; specifies a website's appearance using HTML 5, JavaScript, CSS, media, and other web design technologies
Web Developer	Analyzes, develops, and supports the functionality of a website, including applications that often interact with databases or other online resources

Technology Job Titles and Descriptions

- Careers in technology operations require you to have knowledge about the functioning of hardware, software, and network.

Table 13-2: Technology operations jobs.

Job title	Job description
Computer Technician	Installs, maintains, and repairs hardware and servers; installs, upgrades, and configures software; troubleshoots hardware problems
Help Desk Specialist/Help Desk Technician	Answers technology-related questions in person, on the phone, or via email or an online chat room
Network Administrator/Engineer	Installs, configures, and maintains LANs, WANs, wireless networks, intranets, Internet systems, and network software; identifies and resolves connectivity issues
Technical Project Manager	Guides design, development, and maintenance tasks; serves as interface between programmers/developers and management

Technology Job Titles and Descriptions

- Careers in web marketing and social media require you to be knowledgeable about web-based development platforms, social media apps, and marketing strategies.

Table 13-3: Web marketing and social media jobs

Job title	Job description
Customer Relationship Management (CRM) Specialist	Integrates apps and data related to customer inquiries, purchases, support requests, and behaviors in order to provide a complete application that manages a company's relationships with its customers
Internet/Social Media Marketing Specialist	Directs and implements an organization's use of Internet and social media marketing, including Facebook pages, Twitter feeds, blogs, and online advertisements
Search Engine Optimization (SEO) Expert	Writes and develops web content and website layouts so that they will appear at the beginning of search results when users search for content
User Experience (UX) Designer	Plans and designs software and apps that consider a user's reaction to a program and its interface, including its efficiency, its effectiveness, and its ease of use

Technology Job Titles and Descriptions

- Careers in data storage and analysis require you to be knowledgeable about collecting, analyzing, and reporting data from databases or the web

Table 13-4: Data storage, retrieval, and analysis jobs.

Job title	Job description
Data Scientist	Uses analytics and other Big Data techniques to interpret a company's data from a variety of sources to better understand its performance, make recommendations for improvement, and predict future outcomes
Database Administrator	Creates and maintains the data dictionary; monitors database performance
Database Analyst	Uses data modeling techniques and tools to analyze and specify data usage
Digital Forensics Examiner	Collects and analyzes evidence found on computers, networks, mobile devices, and databases
Web Analytics Expert	Collects and measures Internet data, such as website traffic patterns and advertising, and develops reports that recommend strategies to maximize an organization's web presence

Technology Job Titles and Descriptions

- Careers in app development and mobile technologies require you to have knowledge about trends in the desktop and mobile app market

Table 13-5: App development and mobile technologies jobs.

Job title	Job description
Desktop or Mobile Application Programmer/Developer	Converts the system design into the appropriate application development language, such as Visual Basic, Java, C#, and Objective C, and toolkits for various platforms
Games Designer/Programmer	Designs games and translates designs into a program or app using an appropriate application development language
Mobile Strategist	Integrates and expands the company's initiatives for mobile users
Mobile Technology Expert	Develops and directs an organization's mobile strategy, including marketing and app Development
Virtual Reality Engineer	Designs applications that incorporate technologies (such as VR and 3-D) with tools (such as Google Cardboard) to create storytelling tools and apps

Information Systems in the Enterprise

- Businesses, and their employees, use many types of systems. Enterprise computing refers to the use of technology by a company's employees to meet the needs of a large business. A system is a set of components that interact to achieve a common goal.
- A billing system, for example, allows a company to send invoices and receive payments from customers. Through a payroll system, employees receive paychecks—often deposited directly into their bank accounts.

Information Systems in the Enterprise

Typical Enterprise Information Systems

- An enterprise requires special computing solutions because of its size and geographic distribution. A typical enterprise consists of a wide variety of departments, enters, and divisions—collectively known as functional units.
- Some information systems are used exclusively by only one type of functional unit within the enterprise.

Information Systems in the Enterprise

Table 13-6: Information systems used exclusively by functional units in an enterprise.

Functional unit	Information system
Human Resources (HR)	A human resources information system (HRIS) manages one or more administrative human resources functions, such as maintaining and managing employee benefits, schedules, and payroll
Engineering or Product Development	Computer-aided engineering (CAE) aids in the development and testing of product designs, and often includes CAD (computer-aided design)
Sales	Salesforce automation (SFA) helps salespeople manage customer contacts, schedule customer meetings, log customer interactions, manage product information, and place customer orders

Information Systems in the Enterprise

Table 13-6: Information systems used exclusively by functional units in an enterprise. (Cont.)

Functional unit	Information system
Manufacturing	<ul style="list-style-type: none">• Computer-aided manufacturing (CAM) controls production equipment, such as drills, lathes, and milling machines• Material requirements planning (MRP) monitors and controls inventory, material purchases, and other processes related to manufacturing operations• Manufacturing resource planning II (MRP II) is an extension of MRP that also includes product packaging and shipping, machine scheduling, financial planning, demand forecasting, tracking labor productivity, and monitoring product quality
Customer Service	Customer relationship management (CRM) manages information about customers, past purchases, interests, and day-to-day interactions, such as phone calls, email messages, web communications, and Internet messaging sessions

Information Systems in the Enterprise

- **Enterprise Resource Planning (ERP)** integrates MRP II with the information flow across an organization to manage and coordinate the ongoing activities of the enterprise, including product planning, manufacturing and distribution, accounting and finance, sales, human resources, and customer support.
- Advantages of ERP include complete integration of information systems across departments, better project management, and improved customer service.



Figure 13-3: ERP encompasses all the major activities throughout an enterprise.

Information Systems in the Enterprise

- A transaction processing system (TPS) is an information system that captures and processes data from day-to-day business activities.

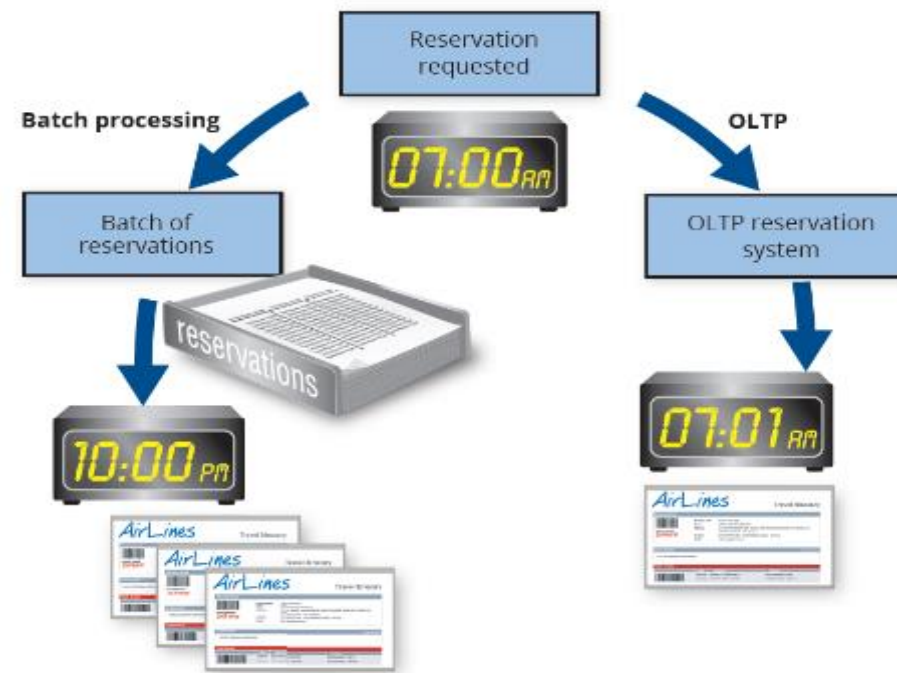


Figure 13-4: Transaction processing systems.

Information Systems in the Enterprise

- With batch processing, the computer collects data over time and processes all transactions later, as a group. With online transaction processing (OLTP), the computer processes each transaction as it is entered.
- A **management information system (MIS)** is an information system that generates accurate, timely, and organized information, so that managers and other users can make decisions, solve problems, supervise activities, and track progress.
- A **decision support system (DSS)** helps users to analyze information and make decisions.
- Programs that analyze data, such as those in a decision support system are called **online analytical processing (OLAP)** programs.

Information Systems in the Enterprise

- An **expert system** is an information system that captures and stores the knowledge of human experts and then imitates human reasoning and decision-making.
- A **knowledge base** is the combined subject knowledge and experiences of human experts.
- The **inference rules** are a set of logical judgments that are applied to the knowledge base each time a user describes a situation to the expert system.
- A **Supply Chain Management (SCM)** system manages the flow of goods and services of a business, including purchasing of materials, inventory planning, manufacturing, and order fulfillment and tracking.

Secure IT: Careers in Security

- Security is a concern for all aspects of technology, including app usage, programming, web development, databases, networks, and more.
- **Cybersecurity** is the protection of systems and networks against hacking, data theft, viruses, and other issues that disrupt services.
- Careers in information and systems security require you to be knowledgeable about potential threats to a device or network, including viruses and hacking.
- Security jobs include Computer Security Incident Responder, Computer Security Specialist/Mobile Security Specialist, Digital Forensics Analyst, Network Security Administrator, Security Analyst, and Security System Project Manager.

Technology Certifications

- Organizations often require technology certification to ensure quality standards and to confirm their workforce remains up to date with respect to technology.
- When you earn a certification, you can include it on your print resume, as well as use a digital badge issued by the exam provider or a third-party organization on your personal website, blog, or LinkedIn page.



Figure 13-5: Microsoft Office Specialist (Fundamentals level) badge.

Technology Certifications

Data Analysis and Database Certifications

- Data analysis certifications focus on the discovery, collection, and analysis of the evidence on computers and networks.
- People with the following jobs may be interested in data analysis and database certification:
 - ✓ Data scientist
 - ✓ Database administrators
 - ✓ Database analysts
 - ✓ Digital forensics examiners
- .

Technology Certifications

Hardware Certifications

- Hardware certifications vary in scope, from a narrow focus with an emphasis on the repair of a specific device to an integrated hardware solution that addresses a company's current and future technology needs.
- People with the following jobs may be interested in hardware certification:
 - ✓ Cable installation technicians
 - ✓ Computer repair technicians
 - ✓ Corporate trainers
 - ✓ Help desk specialists
 - ✓ IT consultants
 - ✓ System engineers and administrators

Technology Certifications

Hardware Certifications

- A popular hardware certification includes CompTIA's A+, which tests knowledge of computer setup, configuration, maintenance, troubleshooting, basic networking skills, and system software.

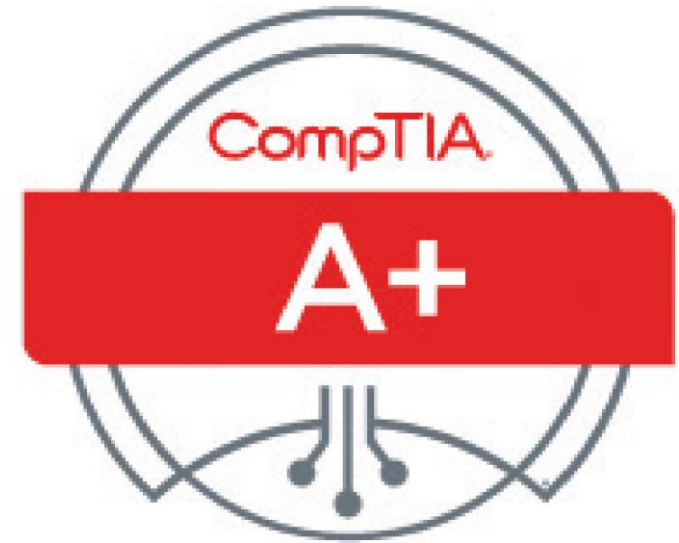


Figure 13-6: CompTIA A+ certification badge.

Technology Certifications

Networking Certifications

- An advanced certification in networking implies that you have achieved a standard of competence, enabling you to address the complex issues that arise when planning, installing, managing, and troubleshooting a network.
- People in the following careers may be interested in network certification:
 - ✓ Hardware service technicians
 - ✓ IT consultants
 - ✓ Network managers
 - ✓ Network engineers
 - ✓ System administrators



Technology Certifications

Operating System Certifications

- Several options for various knowledge levels are available to those seeking operating system certifications.
- Microsoft, RedHat, and others offer certifications that test knowledge of their operating systems.

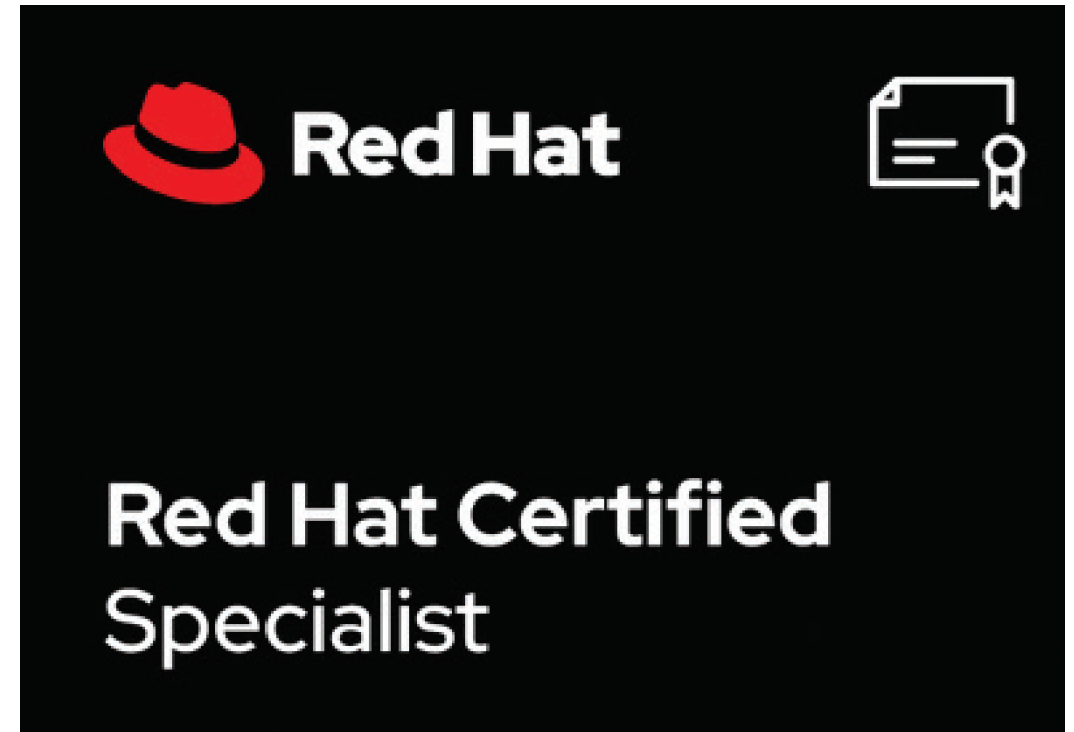


Figure 13-7: RedHat Certified Specialist badge.

Technology Certifications

Operating System Certifications

- People with the following jobs may be interested in certification in operating systems:
 - ✓ Hardware technicians
 - ✓ Help desk specialists
 - ✓ Network administrators
 - ✓ IT consultants
 - ✓ System administrators

Technology Certifications

Programmer/Developer Certifications

- Certifications are usually supported with training programs that prepare applicants for the certification test.
- A popular specific programmer/developer certification includes Google Apps Certified Specialist, which tests user's skills of administering, selling, and deploying Google Apps.

Technology Certifications

Programmer/Developer Certifications

- A broader development certification includes a Project Management Professional (PMP), which tests knowledge of tasks required during system development.



Figure 13-8: PMI's PMP certification badge.

Technology Certifications

- People with the following jobs may be interested in a programmer/developer certification:
 - ✓ Game developers
 - ✓ IT consultants
 - ✓ Mobile application developers
 - ✓ Project leaders/managers
 - ✓ Systems analyst
 - ✓ Web developers

Technology Certifications

Security Certifications

- Security certifications measure a candidate's ability to identify and control security risks associated with any event or action that could cause a loss of or damage to computer hardware, software, data, information, or processing capability.
- A popular specific security certification includes Certified Information Systems Security Professional (CISSP), which tests in-depth knowledge of access control methods, information systems development, cryptography, operations security, physical security, and network and Internet security.

Technology Certifications

- People in the following careers may be interested in security certification:
 - ✓ Information security officers and managers
 - ✓ Law enforcement officials
 - ✓ Military intelligence officers
 - ✓ Network administrators
 - ✓ Wireless network administrators
 - ✓ Network security specialists
 - ✓ Security administrators

Ethics and Issues: Using Your Available Resources to Find a Job

- Many job opportunities may exist in your industry, so it is important to narrow down the available jobs to ones for which you are qualified and in which you are interested.
- Tools at your disposal include the career service department at your school, career planning websites, and online social network.

Ethics and Issues: Using Your Available Resources to Find a Job

- Career websites often allow you to post your **resume** online or enter your professional information in a form at the website for potential employers to review.
- A resume is your opportunity to make the first impression good on potential employers.
- Employers search for notifications to find people who might match with an opportunity they have to offer.
- While a resume lists your accomplishments, skills, employment history, and education, a portfolio shows examples of your work.

Ethics and Issues: Using Your Available Resources to Find a Job

Career Websites

- Graphic artists and other digital media producers may use a portfolio to demonstrate their abilities, style, and past work.



Figure 13-10: Sample online portfolio.

Ethics and Issues: Using Your Available Resources to Find a Job

Start Your Job Search Online

- Starting your job search online enables you to locate available jobs in which you are interested and determine ahead of time if you are qualified for the position, all before spending time applying.
- One can begin a job search by reviewing the information on online social networks, job search websites, and organizations' websites.
- Use the employment database to learn about career opportunities.

Thank You

A blue diamond shape with a brushstroke texture, positioned behind the word 'You'.